

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0
Creation Date: July 15, 2019
Revision Date: July 15, 2019

SECTION 1: Identification

1.1 GHS Product identifier

Product name Ethylenediamine

1.2 Other means of identification

Product number -

Other names 1,2-Diamino-dekan; 1-(aminomethyl)-nonyl-amine; EDA

1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.

Uses advised against no data available

1.4 Supplier's details

Company Shanghai Baishun Biotechnology Co., Ltd

Address No. 26, Lane 918, Lianye Road, Zhelin Town, Fengxian District, Shanghai, 201400, China

Telephone +86-21-37581181

1.5 Emergency phone number

Emergency phone number +86-21-37581181

Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 3
Acute toxicity - Category 4, Oral
Acute toxicity - Category 4, Dermal
Skin corrosion, Sub-category 1B
Skin sensitization, Category 1
Respiratory sensitization, Category 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)





Signal word	Danger
Hazard statement(s)	H226 Flammable liquid and vapour H302 Harmful if swallowed H312 Harmful in contact with skin H314 Causes severe skin burns and eye damage H317 May cause an allergic skin reaction H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
Precautionary statement(s)	
Prevention	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233 Keep container tightly closed. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges. P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... P264 Wash ... thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P272 Contaminated work clothing should not be allowed out of the workplace. P284 [In case of inadequate ventilation] wear respiratory protection.
Response	P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower]. P370+P378 In case of fire: Use ... to extinguish. P301+P317 IF SWALLOWED: Get medical help. P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of water/... P317 Get medical help. P321 Specific treatment (see ... on this label). P362+P364 Take off contaminated clothing and wash it before reuse. P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P363 Wash contaminated clothing before reuse. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P316 Get emergency medical help immediately. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333+P317 If skin irritation or rash occurs: Get medical help. P342+P316 If experiencing respiratory symptoms: Get emergency medical help immediately.
Storage	P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.
Disposal	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Ethylenediamine	Ethylenediamine	107-15-3	203-468-6	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Give one or two glasses of water to drink. Refer for medical attention . Do NOT induce vomiting.

4.2 Most important symptoms/effects, acute and delayed

Vapor inhalations at a concentration of 200 ppm for 5 to 10 minutes will lead to nasal irritation and produce a tingling sensation. Inhalation at concentrations of 400 ppm or greater leads to severe nasal irritation. Respiratory irritation may result. Many individuals are hypersensitive to ethylenediamine exposure; therefore, safe threshold limits are difficult to set. (EPA, 1998)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 l/min. Monitor for pulmonary edema and treat if necessary . Monitor for shock and treat if necessary . Anticipate seizures and treat if necessary . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport . Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal . Cover skin bumps with dry sterile dressings after decontamination . /Organic bases/amines and related compounds/

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use water spray, dry chem, "alcohol resistant" foam, or carbon dioxide. Use water spray to keep fire-exposed containers cool. Solid streams may be ineffective and spread material.

5.2 Specific hazards arising from the chemical

Burning rate: 2.2 mm/minute. When exposed to heat or flame, the material has a moderate fire potential. The material can react readily with oxidizing materials. Containers may explode in heat of fire. Material emits nitrogen oxides when burned. Avoid carbon disulfide, silver perchlorate, imines, oxidizing materials. Stable. Hazardous polymerization may not occur. (EPA, 1998)

5.3 Special protective actions for fire-fighters

Use water spray, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Remove all ignition sources. Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Collect the spilled substance into containers. The container should be made of the same material as the original container.

6.2 Environmental precautions

Remove all ignition sources. Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Ventilation. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

1. Remove all ignition sources. 2. Ventilate area of spill or leak. 3. If in the liq form, absorb on paper towels. Evaporate in a safe place (such as a fume hood). Allow sufficient time for evaporating vapors to completely clear the hood ductwork. Burn the paper in a suitable location away from combustible materials. Large quantities can be collected and atomized in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. ... 4. If in the solid form, collect, allow to melt, and dispose of the liq as above.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. Above 34°C use a closed system, ventilation and explosion-proof electrical equipment. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, acids, chlorinated organic compounds and food and feedstuffs. Dry. Outside or detached storage is preferred. Avoid oxidizing materials, acids, and sources of halogens. Store in a cool, dry, well-ventilated location.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 10 ppm as TWA; (skin); A4 (not classifiable as a human carcinogen). MAK sensitization of respiratory tract and skin (SAH)

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Ethylenediamine is a clear colorless liquid with an ammonia-like odor. Flash point of 91°F and a melting point of 47°F. Corrosive to tissue. Vapors are heavier than air. Produces toxic oxides of nitrogen during combustion. Density 7.5 lb / gal. Used to make other chemicals and as a fungicide.
Colour	Water-white liquid
Odour	Ammonia-like
Melting point/freezing point	11°C
Boiling point or initial boiling point and boiling range	118°C(lit.)
Flammability	Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.
Lower and upper explosion limit/flammability limit	LOWER 2.5%; UPPER 12% @ 100 DEG C /ANHYDROUS 76%/
Flash point	38°C
Auto-ignition temperature	716°F
Decomposition temperature	no data available
pH	11.9 @ 25 deg C (25% soln)
Kinematic viscosity	0.0154 cP @ 25 deg C
Solubility	greater than or equal to 100 mg/mL at 63° F (NTP, 1992)
Partition coefficient n-octanol/water	log Kow = -2.04 @ pH 13
Vapour pressure	10 mm Hg (20 °C)
Density and/or relative density	0.899g/mL at 25°C(lit.)
Relative vapour density	2.07 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on burning. This produces toxic fumes of nitrogen oxides. The substance is a medium strong base. Reacts with chlorinated organic compounds, strong oxidants and acids.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

FLAMMABLE LIQUID WHEN EXPOSED TO HEAT, FLAME OR OXIDIZERS. A base. Highly reactive with many compounds. Can react violently with acetic acid, acetic anhydride, acrolein, acrylic acid, acrylonitrile, allyl chloride, carbon disulfide, chlorosulfonic acid, epichlorohydrin, ethylene chlorohydrin, hydrogen chloride, mesityl oxide, nitric acid, oleum, AgClO₄, sulfuric acid, beta-propiolactone and vinyl acetate. Incompatible with strong acids, strong oxidizers (perchlorate salts), and chlorinated organic compounds. It is also incompatible with halogenated organic compounds and metal

halides. May react with nitromethane and diisopropyl peroxydicarbonate. May ignite on contact with cellulose nitrate. Readily absorbs carbon dioxide from the air to give crusty solid deposits. (NTP, 1992). Ethylenediamine reacts violently with ethylene chlorohydrin. (Lewis, R.J., Sr. 1992. Sax's Dangerous Properties of Industrial Materials, 8th Edition. New York: Van Nostrand Reinhold. pp. 1554.).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Carbon disulfide reacts violently with ... ethylenediamine.

10.6 Hazardous decomposition products

When heated to decomp it emits toxic fumes of /nitrogen oxides and ammonia/.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 500 mg/kg
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

Reproductive toxicity

no data available

STOT-single exposure

The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation may cause asthma.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 Pimephales promelas (fathead minnow) 115.7 mg/l/96 hr @ 22 deg C (95% confidence limit 98.6-131.6 mg/l) /Static bioassay
- Toxicity to daphnia and other aquatic invertebrates: LC50 Daphnia magna 0.88 mg/l /Conditions of bioassay not specified
- Toxicity to algae: no data available

- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

In one standard dilution test using non-acclimated sewage seed, 24 and 47% of the theoretical BOD was removed after 5 and 20 days, respectively, in fresh water, and 2 and 16%, respectively, in salt water(1). In a second standard dilution test using non-acclimated sewage seed, 0.6 and 17% BOD was removed in 5 days using fresh and salt water, respectively(2). The concentration of the ethylenediamine was 7 to 10 ppm in both studies(1,2). Using acclimated activated sludge, 97.5% COD was removed at a rate of 9.8 mg COD/g/hr (3), 67% of the theoretical BOD was removed in 5 days in a second study(4) and 36 and 70% of the theoretical BOD was removed in 5 and 20 days, respectively, in a third study(1). Ethylenediamine, at a concentration of 100 mg/l, showed a 93 to 95% theoretical BOD loss over a 28 day period in the Japanese MITI test using an activated sludge inoculum(5).

12.3 Bioaccumulative potential

An estimated BCF of less than 1 was calculated for ethylenediamine(SRC), using a log Kow of -2.04(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low.

12.4 Mobility in soil

Ethylenediamine has two primary amine groups and at the pH range found in most soils it is expected to be partially protonated given a pKa1 of 10.7 and a pKa2 of 7.6(1). An average Koc of 4766 (range=2071 to 6160) was measured for ethylenediamine in six different soils; five were from the vadose zone and one from an aquifer (saturated zone) (2). pH values ranged from 6.0 to 9.6 and the fraction of organic carbon from 0.0024 to 0.0391 for this group of soils. Soils with increased cation exchange capacity and organic content had greater affinity for ethylenediamine(2).

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1604 (For reference only, please check.)

IMDG: UN1604 (For reference only, please check.)

IATA: UN1604 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID:
ETHYLENEDIAMINE (For reference only, please check.)

IMDG:
ETHYLENEDIAMINE (For reference only, please check.)

IATA:
ETHYLENEDIAMINE (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 8 (For reference only, please check.)

IMDG: 8 (For reference only, please check.)

IATA: 8 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Ethylenediamine	Ethylenediamine	107-15-3	203-468-6
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019

Revision Date July 15, 2019

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Anyone who has shown symptoms of asthma due to this substance should never again come into contact with this substance. Do NOT take working clothes home.

Any questions regarding this SDS, Please send your inquiry to sds@xixisys.com

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